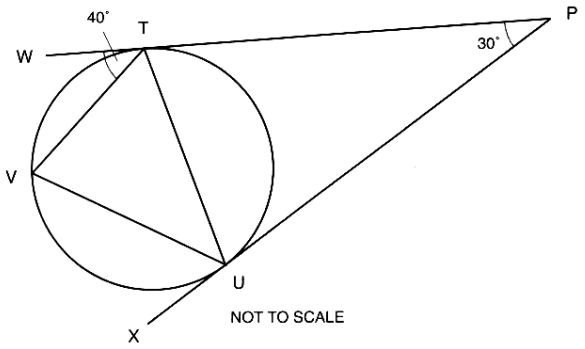
Prep (For Monday 19th Jan) – Answer on the sheet – Name:_____

1 **i** Complete the square: $x^2 + 4x + 7$

ii What transformation maps the curve $y = x^2 - 1$ onto the curve $y = x^2 + 4x + 7$?

2 T, U and V are points on a circle. PTW and PUX are tangents to the circle.
Angle UPT=30° and angle WTV=40°.



Find the size of the following angles, giving a geometrical reason for your answer.

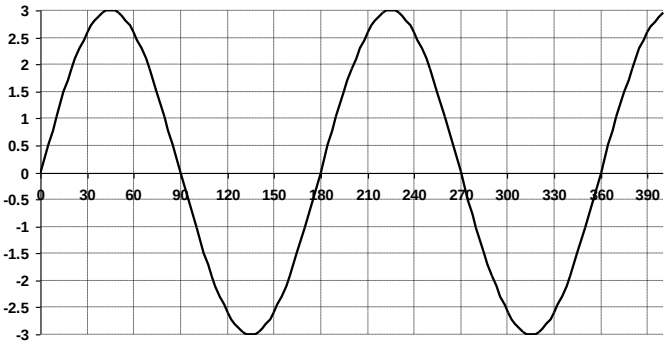
a angle PUT

b angle TVU

c angle XUV.

3 Write down an equation for the curves below:

i



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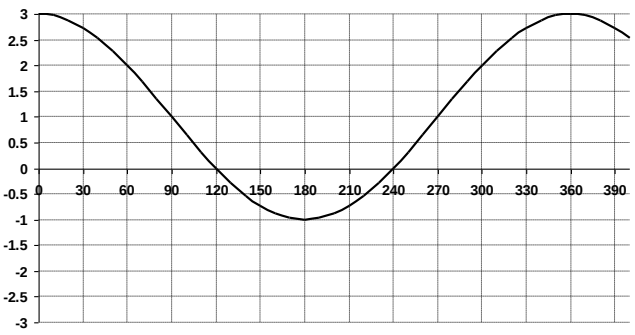
ii



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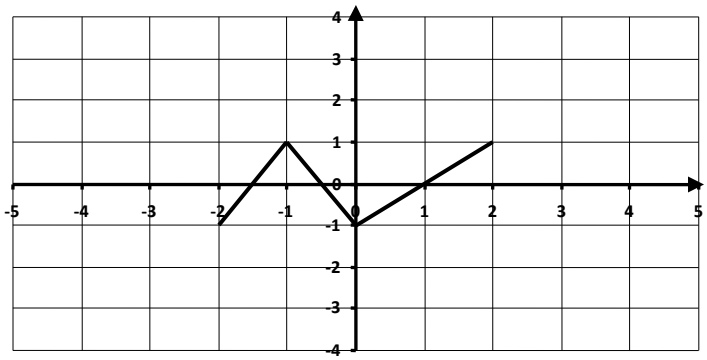
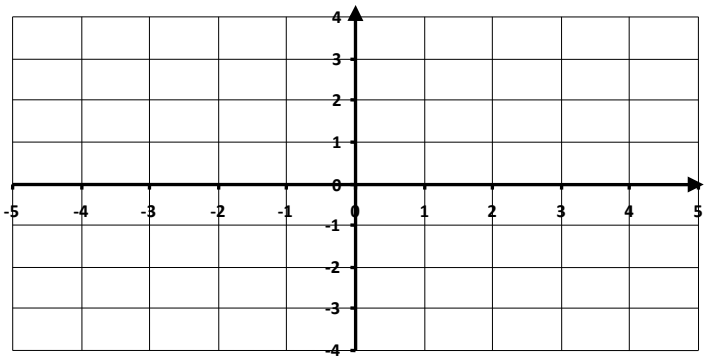
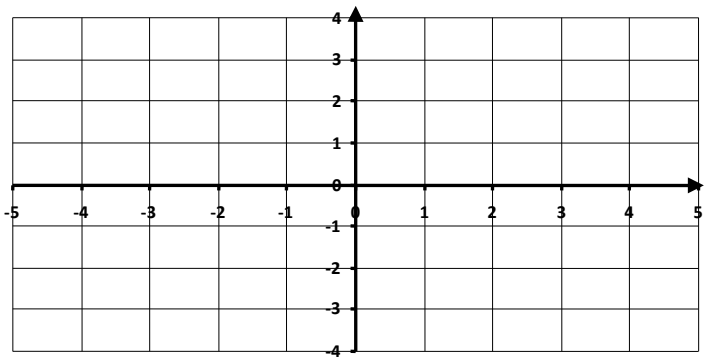
4 The diagram below shows a graph of the function $y = f(x)$ (for $-2 \le x \le 2$).



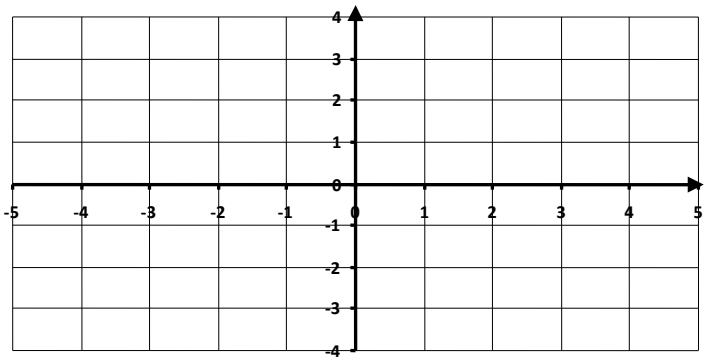
i Sketch, on the axes below, the graph of $y = f(x) + 3$.



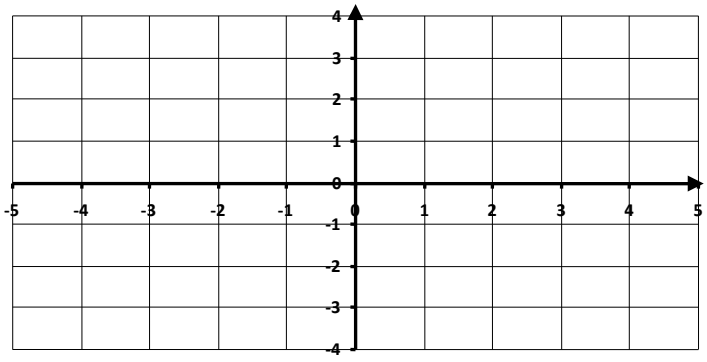
ii Sketch, on the axes below, the graph of $y = f(x - 3)$.



iii Sketch on the axes below, the graph of $y = f(\frac{1}{2}x)$.



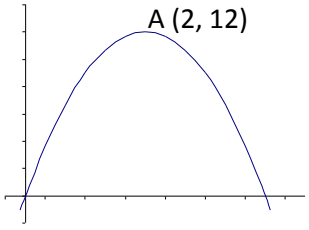
iv Sketch on the axes below, the graph of $y = 2f(x)$.



5 **a** Sketch, on the same axes, $x^2 + y^2 = 34$ and the line $2x - y = 1$.

b Find the co-ordinates of the points where the line meets the curve.

6 Part of the graph of $y = f(x)$ is shown below. The vertex of the curve is A (2, 12).
Write down the co-ordinates of the vertex of each of the following curves:



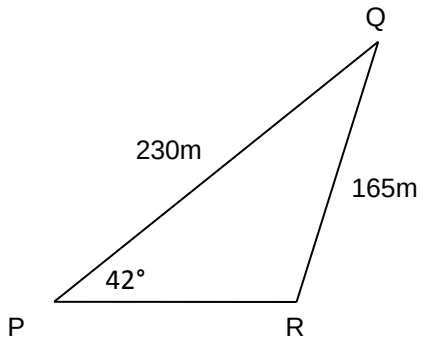
a $y = 3f(x + 7)$

b $y = f(x - 3) - 2$

c $y = f(-x)$

d $y = f(4x)$.

7 The diagram shows a triangular field.



Not to Scale

Given that angle PRQ is obtuse, find the angle PQR, correct to one decimal place.

8 Simplify: $\frac{100}{\sqrt{3}-1}+\sqrt{75}$.

9 Sketch the graph $y=(x+3)(x-4)(6-x)$, labelling the intercepts.